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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/888,848	06/25/2001	Stephen C. Goss	18-29-10	9435

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EXAMINER
GELIN, JEAN ALLAND

ART UNIT	PAPER NUMBER
2681	3

DATE MAILED: 05/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/888,848	GOSS ET AL.	
	Examiner	Art Unit	
	Jean A Gelin	2681	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 June 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-61* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *23-29* is/are allowed.

6)☒ Claim(s) *1-22 and 30-61* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 June 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1, 22, and 58 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, the phrases "the plurality of low-power radios further being effective in receiving a plurality of individual radio channels and converting each of the plurality of individual radio channels into a plurality of voice signals", "transmitting each of the plurality of individual radio channel to low-power" and "receiving optical channels...demodulating...optical channels, and transmitting the radio channels" are not clear. Please clarify how low-power radios receive...and transmit radio channel and convert the received channels to voice signals. The channel is a medium to carry communication signals. It is not clear how to transmit a channel. Appropriate correction is required.

Regarding claim 22, the claim is interpreted and rejected for the same reason as set forth in the rejection above.

Regarding claim 58, the phrase "an RF amplifier amplifies the radio channel to produce amplified radio channels, and transmits amplified radio channel" is not clear. Appropriate correction is required to show how the amplifier amplifies the channel not the signal.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-10, 12-21, 31-43, and 54-55 are rejected under 35 U.S.C. 102(b) as being anticipated by Darcie (EP 0 685 973).

Regarding claims 1, 31, 38, Darcie teaches a central radio pool/traffic router comprising: a plurality of low-power radios (RP1...RPM) that are effective in receiving voice signals and using the voice signals to produce modulated radio channel signals, the plurality of low-power radios further being effective in receiving a plurality of individual radio channels and converting each of the plurality of individual radio channels into a plurality of voice signals and transmitting each of the plurality of voice signals (col. 1, lines 46-57, col. 4, lines 37-53); means for switching (202A) coupled to the plurality of low-power radios (via server 200) and effective in receiving the plurality of voice signals from the plurality of low-power radios and effective in receiving a plurality of individual radio channels and transmitting each of the plurality of individual radio channels to the plurality of low-power radios (col. 8, lines 41-55); means for optically modulating effective in modulating an optical carrier using an RF signal to produce a modulated optical carrier and transmitting the modulated optical carrier (col. 8, lines 17-34); means for optically demodulating effective in receiving a plurality of individual optical channels and demodulating the plurality of individual optical channels

to produce associated radio channel frequencies and transmitting the associated radio channel frequencies (col. 8, lines 17-55 and col. 9, lines 39-55); means for combining effective in receiving the modulated optical signals and combining the modulated optical signals with additional modulated optical signals to produce a composite signal (col. 8, lines 33-57); and means for splitting (network 230) effective in separating associated radio channel frequencies to form a plurality of individual radio channels (network is used to distribute RF signals between server and RPM, fig. 2A).

Regarding claims 2, 32, 39, Darcie teaches wherein the plurality of low-power radios are effective in being assigned to channel frequencies according to channels allotted to the destined cell (col. 6, line 26 to col. 7, line 44).

Regarding claims 3, 33, 40, Darcie teaches wherein each of the plurality of low-power radios is tuned to a different frequency (col. 6, lines 40-45).

Regarding claims 4, 34, 41, Darcie teaches wherein each of the plurality of low-power radios can serve each of a plurality of base stations (col. 5, lines 39-57).

Regarding claims 5, 35, 42, Darcie teaches wherein the plurality of low-power radios comprise a plurality of low-power digital radios (RP within the microcell is low power, col. 1, lines 45-58, col. 4, lines 26-53).

Regarding claims 6, 36, 43, Darcie teaches wherein the plurality of low-power radios comprise a plurality of low-power analog radios (i.e., repeaters transmit air interface in analog form 27-35).

Regarding claims 7, 37, Darcie teaches wherein the composite RF signal comprises digital signals and analog signals (i.e., repeaters transmit air interface in analog form 27-35, item 295 in fig. 2A can be digital and analog).

Regarding claim 8, Darcie teaches wherein the plurality of low-power radios utilize the same radio frequencies that will subsequently be utilized in the destination cells (i.e., radio ports are operated in single-frequency, col. 3, lines 18-23).

Regarding claim 9, Darcie teaches wherein the plurality of low-power radios utilize frequencies that are upbanded or downbanded from the corresponding frequencies used in the destination cell (col. 3, 15-27, col. 7, lines 14-44).

Regarding claim 10, Darcie teaches wherein the means for switching comprises an RF interconnect switch (switching center 300, fig. 3).

Regarding claim 12, Darcie teaches wherein the means for optically modulating comprises an optical modulator (col. 14, lines 11-33).

Regarding claim 13, Darcie teaches wherein each of the plurality of low-power radios are coupled to a dedicated one of the plurality of optical modulators (col. 14, lines 9-43).

Regarding claim 14, Darcie teaches wherein the means for optically demodulating comprises an optical demodulator (col. 14, lines 9-45).

Regarding claim 15, Darcie teaches wherein the means for combining comprises an RF combiner (col. 14, lines 11-15).

Regarding claim 16, Darcie teaches wherein the means for combining comprises an optical multiplexer (col. 14, lines 33-45).

Regarding claim 17, Darcie teaches wherein the plurality of optical multiplexers utilize dense wave division multiplexing (DWDM) to combine the optical signals (col. 14, lines 5-45).

Regarding claim 18, Darcie teaches wherein each of the plurality of optical multiplexers is dedicated to a base station (i.e., within col. 14, lines 33-44).

Regarding claim 19, Darcie teaches wherein the means for splitting comprises an RF splitter (col. 14, lines 10-15).

Regarding claim 20, Darcie teaches wherein the means for splitting comprises an optical demultiplexer (col. 14, lines 10-43).

Regarding claim 21, Darcie teaches wherein the RF signal used to produce a modulated optical carrier comprises a composite RF signal comprising a plurality of individual RF channels (col. 14, lines 9-43).

Regarding claim 54, Darcie teaches a base station for use with a central radio pool/traffic router, the base station comprising: an optical demodulator that extracts an RF signal from an optical carrier (col. 14, lines 25-40); an RF amplifier that receives the extracted RF signal and amplifies the RF signal to produce an amplified signal (col. 9, lines 20-35, col. 14, lines 20-40); and a transmit antenna (258) that receives the amplified signal from the amplifier and radiates the amplified signal into a cell associated with the transmit antenna for reception by cell phones operating within the cell (col. 9, lines 20-47, col. 14, lines 5-40).

Regarding claim 55, Darcie teaches wherein the RF amplifier amplifies a composite RF signal that spans multiple radio frequency channels (col. 14, lines 10-45).

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claim 30 is rejected under 35 U.S.C. 102(e) as being anticipated by Yu (US 6,597,908).

Regarding claim 30, Yu teaches a method for transmitting a message from a first phone to a cell phone utilizing a central radio pool/traffic router (CRP/TR) (i.e., BSC) the method comprising the steps of: receiving a call intended for the cell phone from the first phone at a switch (i.e., received the call at the BSC, col. 4, lines 10-21); sending a page over a control channel from one of the plurality of low-power radios to a plurality of base stations, each of which transmits the page within its cell (i.e., the BSC pages all base station over the control channel, col. 4, lines 10-25); receiving indication from one of the plurality of base stations that the intended cell phone is in the geographic area served by the one of the plurality of base stations (i.e., base station in the area located the phone transmits a page response, col. 4, lines 13-26); assigning one of the plurality of low-power radios in the CRP/TR to the call (col. 4, lines 23-26); and routing signals between the assigned low-power radio and the one of the plurality of base stations serving the area in which the cell phone is operational (col. 4, lines 1-26).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 11, 22, 44-53, 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Darcie (EP 0 685 973) in view of Motley et al. (EP 0 368 673).

Regarding claim 11, Darcie teaches all the limitations above except means for switching comprises an optical switching matrix.

However, the preceding limitation is known in the art of communications. Motley teaches a matrix switch for selectively interconnecting the transceivers and the radio ports through the fiber optic network (col. 2, lines 2-5). Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to implement the technique of Motley within the system of Darcie in order the system allows for centralisation of transceivers into base centers, and the consequent advantages in terms of technical and commercial gain, by having the transceivers selectively connectable through the fiber optic network.

Regarding claims 22, 44, and 61, Darcie teaches all the limitations as recited in claim 1 above except a switch for switching voice and or data signals between the CRP/TR and one or more external networks; and a control complex that includes a processor.

However, the preceding limitations are known in the art of communications. Motley teaches a centralized control connected to a switch to control optical, RF, baseband routing and switching, and coordinate the allocation of RF carriers and channels; using the switching means and centralized control, a user can access external network through radio port with a suitable cordless telephone (col. 3, line 12 to col. 4, line 35). Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to implement the technique of Motley within the system of Darcie in order that the use of diversity can easily be achieved centrally through switching or combining links to two or more ports, to improve performance of mobiles covered by those ports (col. 4, lines 2-16).

Regarding claim 50, the claim includes the limitations of claim 44, therefore the claim is interpreted and rejected for the same reason as set forth in the rejection of claim 44 above.

Regarding claims 45, 51, Darcie teaches wherein the plurality of low-power radios utilize the same radio frequencies that will subsequently be utilized in the destination cells (i.e., radio ports are operated in single-frequency, col. 3, lines 18-23).

Regarding claims 46, Darcie teaches wherein the plurality of low-power radios utilize frequencies that are upbanded or downbanded from the corresponding frequencies used in the destination cell (col. 3, 15-27, col. 7, lines 14-44).

Regarding claims 47, 52, Darcie teaches wherein each of the plurality of low-power radios are coupled to a dedicated one of the plurality of optical modulators/demodulators (col. 14, lines 9-43).

Regarding claim 48, Darcie teaches wherein the plurality of optical multiplexers utilize dense wave division multiplexing (DWDM) to combine the optical signals (col. 14, lines 5-45).

Regarding claim 49, 53, Darcie teaches wherein each of the plurality of optical multiplexers is dedicated to a base station (i.e., within col. 14, lines 33-44).

9. Claims 56, 57, and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beasley (US 5,918,154) in view of Motley et al. (EP 0 368 673).

Regarding claims 55, 60, Beasley teaches a base station for use with a central radio pool/traffic router, the base station comprising: a plurality of diversity receive antennas that receive multipath signals from a plurality of cell phones (diversity antennas illustrated in fig. 1 to improve the link quality in the presence of multipath); an RF receiver that diversity-processes the multipath signals to produce a diversity-processed signal (col. 3, lines 15-20); and a modulator that receives the diversity processed signal and modulates a carrier using the diversity-processed signal (col. 5, lines 7-13).

Beasley does not specifically teach an optical modulator that modulates an optical carrier signal.

However, the preceding limitation is known in the art of communications. Motley teaches the use of optical carrier; in both the base center and RF ports there are radio/optical interfaces, which can place an RF signal onto an optical carrier (col. 2, lines 30-49). Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to implement the technique of Motley within the

system of Beasley in order that a suitable optical detector receiving an amplitude modulated optical signal can produce a direct RF output.

Regarding claim 57, Beasley teaches wherein the plurality of diversity receive antennas receive multipath signals that span multiple radio frequency channels (col. 1, lines 1-28).

10. Claims 58, 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Motley et al. (EP 0 368 673) in view of Beasley (US 5,918,154).

Regarding claim 58, Motley teaches a base station for use with a central radio pool/traffic router, the base station comprising: an optical demultiplexer that separates individual optical channels from a composite optical signal received from the central radio pool/traffic router and transmits the individual optical channels (col. 2, line 52 to col. 3, line 11); an optical demodulator that receives the individual optical channels and reverts each individual optical channel to an associated radio channel (col. 3, lines 12-45).

Motley does not specifically teach an RF amplifier that receives the radio channels, amplifies the radio channels to produce amplified radio channels, and transmits the amplified radio channels; and an antenna that receives the amplified radio channels and radiates the amplified radio channels within a cell associated with the base station.

However, the preceding limitations are known in the art of communications. Beasley teaches RF amplifiers to amplify radio signals and supplying modulated transmit signals through to an antenna (col. 5, lines 1-27). Therefore, it would have

been obvious to one of ordinary skill in the art, at the time of the invention, to implement the technique of Beasley within the system of Motley in order to re-establish the correct signal level prior to the second diplexer which connects the signal to the antenna.

Regarding claim 59, Motley in view of Beasley teaches all the limitations above. Motley further teaches wherein the optical demodulator restores the correct channel spacing of each individual optical channel (col. 3, line 1 to col. 4, line 45).

Allowable Subject Matter

11. Claims 23-29 are allowed.

12. The following is a statement of reasons for the indication of allowable subject matter: the prior art teaches modulating the voice signal at the radio onto a radio channel to produce a modulated voice signal.

On the other hand, the Applicant teaches the steps of modulating an optical carrier by the optical modulator/demodulator using the composite RF signal, thereby translating the composite frequencies to optical frequencies; sending the modulated optical carrier to a base station over an optical fiber link; demodulating the optical carrier to produce a composite RF signal; and transmitting the composite RF signal from the base station to the cell phone. These limitations, in conjunction with all limitations and in the same sequence recited in claim 23, have not been disclosed, taught, or made obvious over the prior art of record.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Inamura (US 6,188,879) teaches system and method of testing over all and individual antennas of a switched spaced diversity receiver.

Carlson (US 6,026,302) teaches system and method for load reduction in a mobile communication system.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean A Gelin whose telephone number is (703) 305-4847. The examiner can normally be reached on 9:00 AM to 6:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Erika A Gary can be reached on (703) 308-0123. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JEAN GELIN
PATENT EXAMINER

JGelin
May 13, 2004